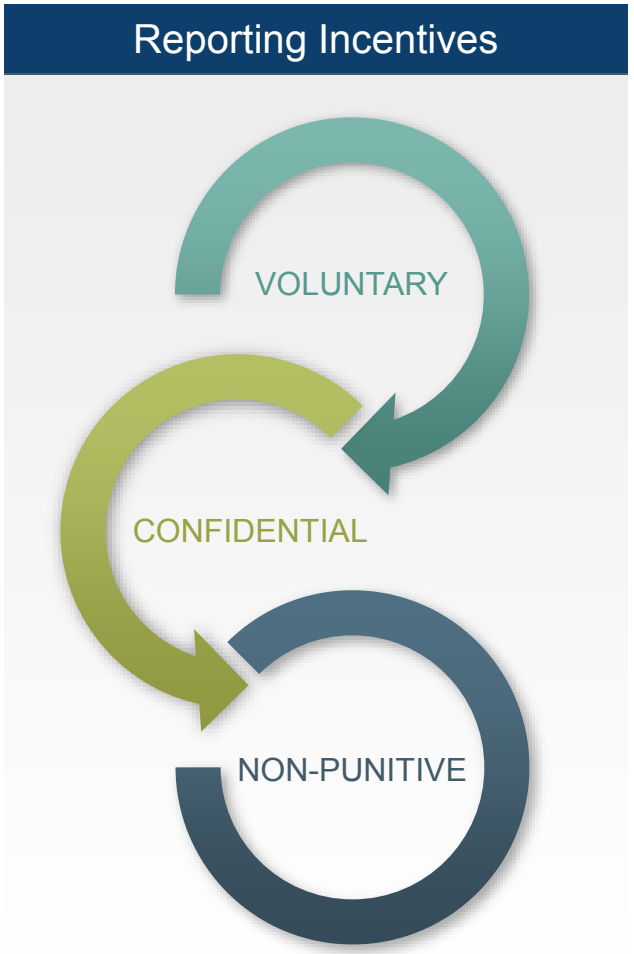
ASRS Program Briefing

ASRS Program Briefing Index

ASRS Program Overview

Concept & Mission

The Aviation Safety Reporting System (ASRS) receives, processes and analyzes voluntarily submitted incident reports from pilots, air traffic controllers, dispatchers, cabin crew, maintenance technicians, and others. Reports submitted to ASRS may describe both unsafe occurrences and hazardous situations. Information is gathered from these reports and disseminated to stakeholders. ASRS's particular concern is the quality of human performance in the National Airspace System.



Purpose

- **Identify deficiencies and discrepancies in the National Airspace System**
  - Objective: Improve the current aviation system
- **Provide data for planning and improvements to the future National Airspace System**
  - Objective: Enhance the basis for human factors research & recommendations for future aviation procedures, operations, facilities, and equipment

ASRS Background

WW II	Industry and Military recognized value of voluntary incident reporting
1958	Need for U.S. Incident Data System raised during FAA Enactment Hearings
Oct. 1974	United Airlines incident foreshadowed TWA 514 Accident
Dec. 1974	TWA 514 Accident
Apr. 1975	Study of the National Air Transportation System as a Result of the Secretary's Task Force on the FAA Safety Mission
May 1975	Aviation Safety Reporting Program (ASRP) Implemented (FAA)
May 9, 1975	Advisory Circular 00-46A Issued
Apr. 1976	Aviation Safety Reporting System (ASRS) Established (NASA/FAA)

ASRS Staff

The ASRS Staff is composed of highly experienced pilots, air traffic controllers and mechanics, as well as a management team that possess aviation and human factors experience. ASRS Analysts' experience is comprised of over 600 cumulative years of aviation expertise covering the full spectrum of aviation activity: air carrier, corporate, military, and general aviation; Air Traffic Control in Towers, TRACONs, Centers, and Military Facilities. Analyst cumulative flight time exceeds 200,000 hours in over 50 different aircraft.

In addition, the ASRS Staff has human factors and psychology research experience in areas such as crew resource management, training, fatigue, user interface design, usability evaluations, and research methodology.

Documents Governing ASRS Immunity & Confidentiality

- Federal Register Notice, 1975 & 1976
- Federal Aviation Regulations Part 91.25 (14 CFR 91.25)
- FAA Advisory Circular 00-46E
- FAA policy concerning Air Traffic Controllers regarding ASRS reporting, FAA Order JO 7200.20

The Immunity Concept

Paragraph 9. c. FAA Advisory Circular No. 00-46E

c. **Enforcement Restrictions**. The FAA considers the filing of a report with NASA concerning an incident or occurrence involving a violation of 49 U.S.C. subtitle VII or the 14 CFR to be indicative of a constructive attitude. Such an attitude will tend to prevent future violations. Accordingly, although a finding of violation may be made, neither a civil penalty nor certificate suspension will be imposed if:

1. The violation was inadvertent and not deliberate;

2. The violation did not involve a criminal offense, accident, or action under 49 U.S.C. § 44709, which discloses a lack of qualification or competency, which is wholly excluded from this policy;

3. The person has not been found in any prior FAA enforcement action to have committed a violation of 49 U.S.C. subtitle VII, or any regulation promulgated there for a period of 5 years prior to the date of occurrence; and

4. The person proves that, within 10 days after the violation, or date when the person became aware or should have been aware of the violation, he or she completed and delivered or mailed a written report of the incident or occurrence to NASA.

ASRS Stakeholders

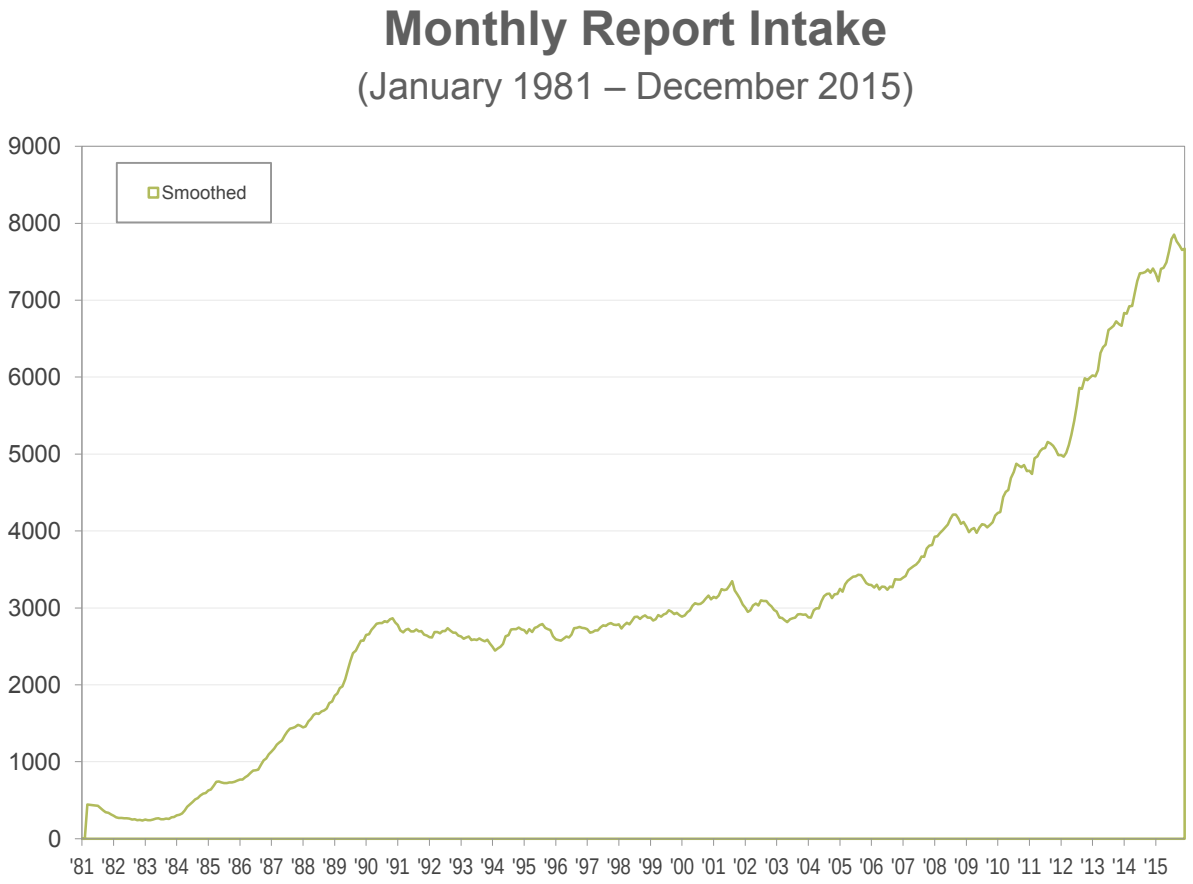
Report Processing

Report Intake Overview

ASRS receives reports from pilots, air traffic controllers, cabin crew, dispatchers, maintenance technicians, and others involved in aviation operations.

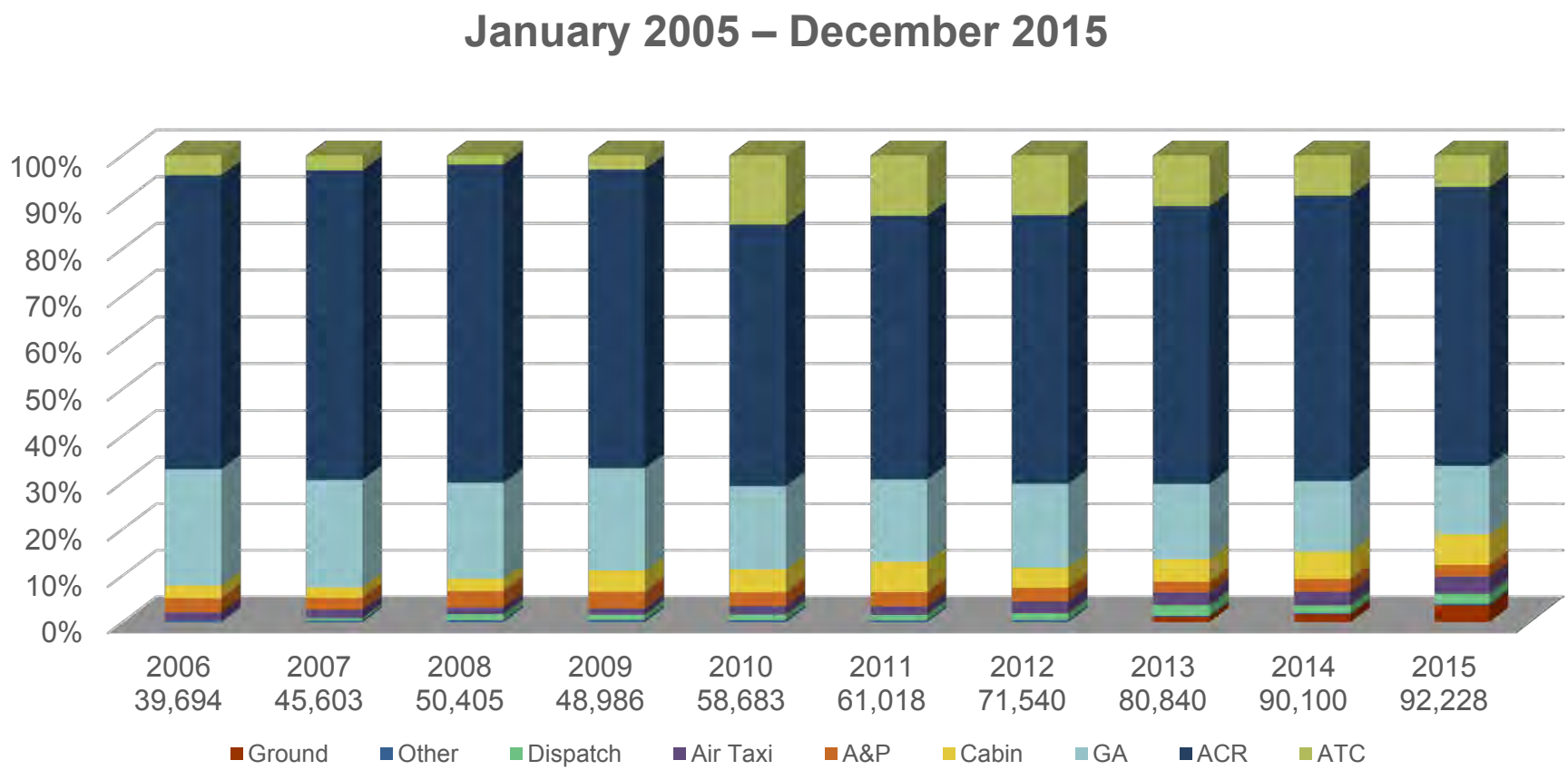
ASRS's report intake has been robust from the first days of the program, in which it averaged approximately 400 reports per month. In recent years, report intake has grown at an enormous rate. Intake now averages 1,774 reports per week and more than 7,686 reports per month.

Report Intake Metrics



- Total Program Report Intake = **1,322,830**
- Total Report Intake for 2015 = **92,228**
- Nearly 5-fold increase since 1988
- Averaging 7,686 reports per month, 372 per working day

Incident Reporter Distribution

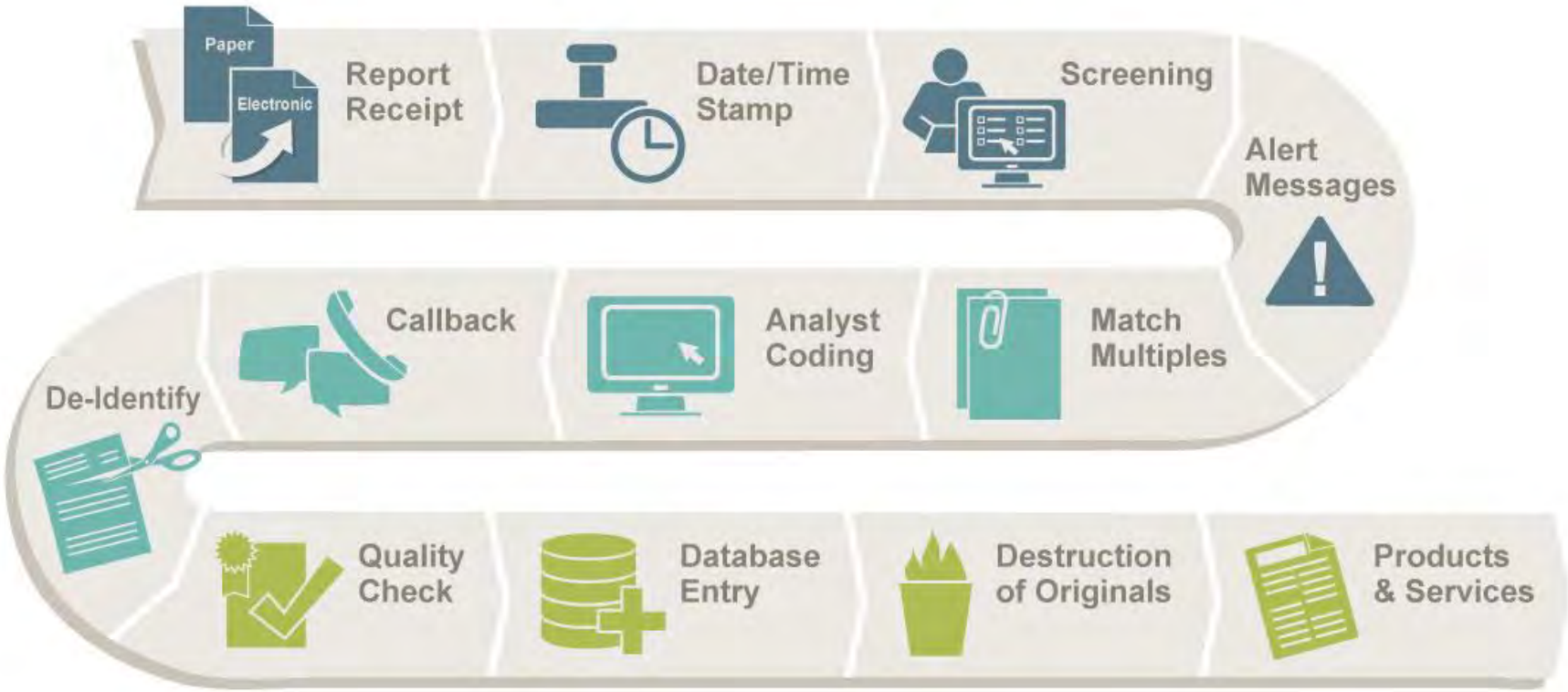


Report Processing Overview

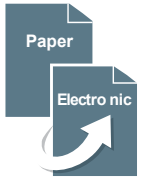
ASRS has securely processed over 1.3 million reports in its 40 year history. The process contains critical elements that ensure each report is handled in a manner that maintains reporter confidentiality while maximizing the ability to accurately assess the safety value of each report. ASRS report processing begins with the receipt of reports through electronic submission or from the post office, and ends with the final coded report entering the ASRS Databases.

Reports sent to the ASRS are widely regarded as one of the world's largest sources of information on aviation safety and human factors.

Report Processing Flow



Report Processing Flow



ASRS paper reports are picked-up daily from the Moffett Field Post Office or are received electronically via website Electronic Report Submission (ERS) or ASAP data transmissions

Every report is date and time stamped based on the date of receipt

Two ASRS Analysts “screen” each report within three working days to provide initial categorization and to determine the triage of processing

ASRS Analysts may identify hazardous situations from reports and issue an Alert Message. De-identified information is provided to organizations in positions of authority for further evaluation and potential corrective actions

Report Processing Flow

ASRS retains high-level categorization of 100% of reports received. Based on initial categorization, multiple reports on the same event are brought together to form one database "record"

ASRS Analysts identify reports that require further analysis and entry into the public ASRS database. During the detailed Report Analysis process, reports are codified using the ASRS taxonomy.

An ASRS Analyst may choose to call a reporter on the telephone to clarify any information the reporter provided. This information is added to the analysis and final record.

To ensure confidentiality all identifying data is removed. After analysis, the Identification Strip, the top portion of the report, is returned to the reporter. This ID strip acts as the reporter's proof of submittal. All physical and electronic ID strip data with the reporter's name, address, date and time stamp is removed.

Report Processing Flow

All reports that receive further analysis go through a Final Check to assure coding accuracy. Quality Assurance checks are also performed for coding quality.

Final coded reports enter the ASRS Database. These de-identified records are then available in the ASRS Database Online, which is available through the ASRS website.

Original reports, both physical and electronic data, are destroyed to completely ensure confidentiality

ASRS uses the information it receives to promote aviation safety through a number of products and services, such as Alert Messages, Search Requests, a monthly newsletter, focused studies and more

ASRS Products & Services

Alert Messages

Safety information issued to organizations in positions of authority for evaluation and possible corrective actions.

CALLBACK

Monthly newsletter with a lessons learned format, available via website and email.

Quick Responses

Rapid data analysis by ASRS staff on safety issues with immediate operational importance generally limited to government agencies.

ASRS Directline

Safety topic summaries based on ASRS reports published to meet the needs of operators and flight crews .

ASRS Database

The public ASRS Database Online and data available in Database Report Sets or Search Requests fullfilled by ASRS staff.

Focused Studies/Research

Studies/Research conducted on safety topics of interest in cooperation with aviation organizations

ASRS Products & Services Metrics

April 1976 – December 2015

Significant Items	Quantity
Incident Reports Received	1,322,830
Safety Alert Messages	6,191
Quick Responses	143
Search Requests	7,499
CALLBACK Issues	431
ASRS Directline Issues	10
Research Studies	64

Alert Messages

Alert Message Overview

When ASRS receives a report describing a hazardous situation, for example, a defective navigation aid, an aircraft system anomaly, a confusing procedure, or any other circumstance which might compromise safe flight – an alerting message is issued using de-identified information provided in the reports.

Alerting messages have a single purpose: to relay safety information to organizations in positions of authority so that they can evaluate the information and take possible corrective actions.

Alert messages are classified as **Alert Bulletins** or **For Your Information Notices**, and may be included in monthly **ASRS Safety Teleconferences**.

ASRS Alerting Pyramid

ASRS has no direct authority to directly correct safety issues.
It acts through and with the cooperation of others.

Alerting Metrics

January 2005 – December 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Alert Messages Issued	75	63	40	30	43	50	40	44	50	48
FYI Notices Issued	117	279	235	206	222	151	177	129	109	104
Response Rate to AB/FYI	35%	49%	46%	38%	34%	29%	27%	28%	48%	49%
Response Rate Non-Manufacturer	55%	64%	55%	26%	36%	38%	25%	37%	73%	58%

Alerting Subjects

January 2005 – December 2015

Subject	Total
Aircraft Systems	718
Airports Facility Status and Maintenance	471
Other	272
ATC Procedures	230
Airport Lighting and Approach Aids	151
ATC Equipment	123
ATC Operations	75
Hazards to Flight	64
Navigation	37
Aircraft Power Plants	36
Aircraft Avionics	35

Alerting Responses

January 2004 – December 2015

Response	Percentage
Action taken as a result of the AB/FYI	22%
Action initiated before AB/FYI received	15%
Action initiated in response to AB/FYI but not completed	11%
Issue raised by AB/FYI under investigation	5%
Addressee agrees with AB/FYI but unable to resolve	3%
Addressee disputes factual accuracy of AB/FYI	21%
Information in AB/FYI insufficient for action	12%
Addressee in factual agreement but sees no problem	7%
Action not within addressee's jurisdiction	3%
For information only, no response expected	1%

Total 56%

Examples of Safety Alerting Success

- **Searey LSA Battery Case Fire Hazard (AB 2015:32)**
  Progressive Aerodyne Inc. Manager responded and stated *"In order to prevent this event from ever recurring, a plastic battery holder was developed. It envelops the battery, making it impossible to have battery abrasion or damage, regardless of the battery hold down strap tension. The new plastic retainer was sent to all owners of Searey LSA aircraft for immediate installation, and is now standard equipment for new aircraft."*

- **DFW RNAV STAR SHAAM Confusion (FYI 2015-27)**
  An FAA D10 TRACON Airspace and Procedures Manager responded and stated *"A bottom altitude is now published on the SHAAM STAR. It is a mandatory crossing at GREGS waypoint of 9,000 feet. This change was made on the June 25, 2015 charting cycle. Prior to the change, the correct procedure would have been, "Descend via the SHAAM STAR, cross GREGS at and maintain 9,000. We are certainly receptive to the statement that cockpit workload and complexity is increased when routings are changed. However, we do not agree that there should be a specific mileage cut off point. We will continue to educate our operational personnel on the workload that is added in the cockpit when multiple changes are made."*

- **ABQ Hot Spot Taxiway Signage (AB 2015:7)**
  An Albuquerque International Sunport Airport Manager responded stating *"We are in receipt and have reviewed alert bulletin AB 2015:7/5-1. Additional steps have been taken regarding the referenced area since the date of the bulletin: Additional yellow ground markings have been added at the closed TWY E-5 further denoting its status as a closed taxiway. Green paint will be applied shortly on the concrete that was part of closed TWY E-5 to differentiate it from surrounding areas. Runway edge lights were added along the side of Runway 8-26 where TWY E-5 was, replacing the in-ground lights that were there."*

Quick Responses

Quick Response Overview

Quick Responses are rapid turnaround data analysis that are typically accomplished within two to ten business days of the request. They are a high value service directed towards safety issues with immediate operational importance. Quick Responses are generally limited to government agencies such as FAA, NTSB, NASA, and U.S. Congress.

Recent Quick Response Applications

- An Analysis of Flight Service Station Related Incidents (QR341)
- An Analysis of General Aviation ADS-B Related Incidents (QR340)
- An Analysis of Part 121 Similar Call Sign Related Incidents (QR339)
- An Analysis of Part 121 Flight Crew Fatigue Related Incidents (QR338)

ASRS Database

ASRS Database

- Information in the ASRS Database is available publicly. The ASRS will provide **Search Requests** to government agencies, members of Congress, aviation safety organizations, and others. ASRS will search its database, download relevant reports, and send to requestor.
- Direct access to search de-identified reports in the ASRS database is now available through **ASRS Database Online** http://asrs.arc.nasa.gov/search/database.html
- For your convenience, selected relevant reports on several safety topics are available on the website called **ASRS Database Report Sets** http://asrs.arc.nasa.gov/search/reportsets.html
- The ASRS Database is also available and updated monthly through the FAA Aviation Safety Information Analysis and Sharing (ASIAS) website http://www.asias.faa.gov/

ASRS Database Metrics

- Since the inception of ASRS, over 7,499 **Search Requests** (SRs) have been directly provided by ASRS Research Staff to various aviation organizations and agencies, as well as individuals through December 2015
- The activity on the ASRS website for **ASRS Database Online** is over 1,658 completed queries a month
- From the ASRS website, **ASRS Database Report Sets** are downloaded on average over 4,497 times a month, Report Sets were first posted in January 2000

Search Requestors by Organization

January 2005 – December 2015

Organization	Total
FAA	190
NASA	75
Air Carriers	75
Media	64
NTSB	58
Alphabet Groups	48
Miscellaneous Safety Organizations	23
Individuals	20
Other	19

Organization	Total
Student	15
Research Organizations	14
Aircraft Manufacturers	11
Miscellaneous Government	7
Foreign	7
Law Firms	5
Military	5
Educational Institutes	4
DHS	2

Recent Search Requests Samples

- **Part 121 and 129 Evacuation Related Incidents (SR 7219)**
  - Completed for the NTSB
- **Unmanned Aerial Vehicle (UAV) Related Incidents (SR 7210)**
  - Completed for the CIA
- **Flight Service Station Related Incidents (SR 7218)**
  - Completed for the OIG
- **Conflicts Involving Military Aircraft in Civilian Airspace (SR 7214)**
  - Completed for the NTSB

CALLBACK

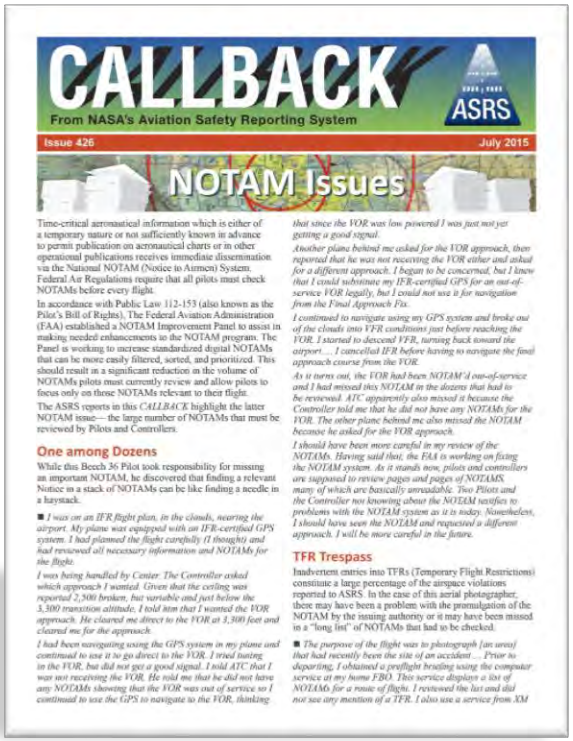
CALLBACK Overview

CALLBACK, the award winning ASRS monthly safety newsletter, has been published since 1979 in a popular "lessons learned" format. *CALLBACK* presents ASRS report excerpts that are significant, educational, and timely. Occasionally features on ASRS program developments and research are also presented. Over 431 issues have been published and distributed throughout the U.S. and to the international aviation community. All issues since December 1994 are available for download at the ASRS website at:

http://asrs.arc.nasa.gov/publications/callback.html

CALLBACK Distribution and Subscription

- In addition to being published online, *CALLBACK* is distributed by email. Subscription is free and available via the ASRS website.
- The total number of email subscribers for 2015 was over 27,700
- *CALLBACK* views for 2015 (HTML and PDF) were over 343,000



CALLBACK

From NASA's Aviation Safety Reporting System

ASRS

Issue 426 July 2015

NOTAM Issues

Time-critical aeronautical information which is either of a temporary nature or not sufficiently known in advance to permit publication on aeronautical charts or in other operational publications receives immediate dissemination via the National NOTAM (Notice to Airmen) System. Federal Air Regulations require that all pilots must check NOTAMs before every flight.

In accordance with Public Law 112-153 (also known as the Pilot's Bill of Rights), The Federal Aviation Administration (FAA) established a NOTAM Improvement Panel to assist in making needed enhancements to the NOTAM program. The Panel is working to increase standardized digital NOTAMs that can be more easily filtered, sorted, and prioritized. This should result in a significant reduction in the volume of NOTAMs pilots must currently review and allow pilots to focus only on those NOTAMs relevant to their flight.

The ASRS reports in this *CALLBACK* highlight the latter NOTAM issue— the large number of NOTAMs that must be reviewed by Pilots and Controllers.

One among Dozens

While this Beech 36 Pilot took responsibility for missing an important NOTAM, he discovered that finding a relevant Notice in a stack of NOTAMs can be like finding a needle in a haystack.

■ *I was on an IFR flight plan, in the clouds, nearing the airport. My plane was equipped with an IFR-certified GPS system. I had planned the flight carefully (I thought) and had reviewed all necessary information and NOTAMs for the flight.*

I was being handled by Center. The Controller asked which approach I wanted. Given that the ceiling was reported 2,500 broken, but variable and just below the 3,300 transition altitude, I told him that I wanted the VOR approach. He cleared me direct to the VOR at 3,300 feet and cleared me for the approach.

I had been navigating using the GPS system in my plane and continued to use it to go direct to the VOR. I tried tuning in the VOR, but did not get a good signal. I told ATC that I was not receiving the VOR. He told me that he did not have any NOTAMs showing that the VOR was out of service so I continued to use the GPS to navigate to the VOR, thinking that since the VOR was low powered I was just not yet getting a good signal.

Another plane behind me asked for the VOR approach, then reported that he was not receiving the VOR either and asked for a different approach. I began to be concerned, but I knew that I could substitute my IFR-certified GPS for an out-of-service VOR legally, but I could not use it for navigation from the Final Approach Fix.

I continued to navigate using my GPS system and broke out of the clouds into VFR conditions just before reaching the VOR. I started to descend VFR, turning back toward the airport.... I cancelled IFR before having to navigate the final approach course from the VOR.

As it turns out, the VOR had been NOTAM'd out-of-service and I had missed this NOTAM in the dozens that had to be reviewed. ATC apparently also missed it because the Controller told me that he did not have any NOTAMs for the VOR. The other plane behind me also missed the NOTAM because he asked for the VOR approach.

I should have been more careful in my review of the NOTAMs. Having said that, the FAA is working on fixing the NOTAM system. As it stands now, pilots and controllers are supposed to review pages and pages of NOTAMS, many of which are basically unreadable. Two Pilots and the Controller not knowing about the NOTAM testifies to problems with the NOTAM system as it is today. Nonetheless, I should have seen the NOTAM and requested a different approach. I will be more careful in the future.

TFR Trespass

Inadvertent entries into TFRs (Temporary Flight Restrictions) constitute a large percentage of the airspace violations reported to ASRS. In the case of this aerial photographer, there may have been a problem with the promulgation of the NOTAM by the issuing authority or it may have been missed in a "long list" of NOTAMs that had to be checked.

■ *The purpose of the flight was to photograph [an area] that had recently been the site of an accident... Prior to departing, I obtained a preflight briefing using the computer service at my home FBO. This service displays a list of NOTAMs for a route of flight. I reviewed the list and did not see any mention of a TFR. I also use a service from XM*

Aviation Community Feedback

Sample reader comments from 2015

"I look forward to your publication. I read it with great application to my own flying. Lessons Learned by others is an effective performance/skill modifier without the costly results."

"Thanks for another great issue of CALLBACK. Always informative, and well written."

"Love the new format for Callback. The What Would You Have Done is a great format!"

"First Half of the Story" is a fantastic means for lesser experienced pilots such as myself to go thru scenarios and get better educated. It also helps to inspire pilots to dig further for solutions and not give up in the face of a very difficult scenario. Thank you for the outstanding material - keep it coming."

ASRS Directline

ASRS Directline Overview

ASRS Directline is another award-winning ASRS publication. Although not currently published, this safety journal had an estimated readership of 20,000. Ten issues have been published since 1991 with an average of three to five articles per issue. All issues are available for download at the ASRS website at:

http://asrs.arc.nasa.gov/publications/directline.html

The feasibility of producing this publication again in the near future is being assessed.

Focused Studies/Research

Focused on Operations and Human Factors

- 64 Research Studies and Special Papers Published
  - **Operations:** Deviations, De-Icing/Anti-Icing, Rejected Takeoffs, Clearances, Weather Encounters, Landing Incidents, Runway Transgressions, TCAS II, Crossing Restrictions, etc.
  - **Human Factors:** Communication, Memory, Confusion, Time Pressure, Judgment, Training, Crew Performance, Flight Crew Monitoring, etc.
  - **Confidential Reporting:** ASRS Reporting Model, Case for Confidential Reporting, Development of ASRS, Cross Industry Applications, etc.
- Research agendas are developed in collaboration with government and industry safety organizations
- There are over 30 ASRS Research Papers available to download on the ASRS website

Structured Callback: Supplemental Question Set

Wake Vortex Encounter Study

In cooperation with the FAA ASRS is currently examining Wake Vortex Encounter incidents reported to ASRS. ASRS began this study in 2007 and will continue through 2016. At present the Wake Vortex Encounter Study includes all airspace within the United States, enroute and terminal. In quarterly reports, the ASRS documents event dynamics and contributing factors underlying unique wake vortex encounter incidents.

A sampling of the factors to be analyzed includes reporters' assessed magnitude of wake encounter, aircraft spacing, aircraft type, runway configuration, and consequences from the encounter.

Structured Callback: Supplemental Question Set

Meteorological and Aeronautical Information Services Data Link Services and Applications Study

In cooperation with the FAA, ASRS is conducting a study focused on meteorological and aeronautical information services (AIS) via data link. ASRS is gathering reports of incidents that occurred while pilots were utilizing weather or AIS information in the cockpit (textual and/or graphical) obtained via data link (including ACARS) or other sources on the ground or in the air.

Some factors to be analyzed include type of weather data received, cockpit display utilized, software or applications used to receive meteorological information, and end user graphical interface issues. In March of 2012 an interim report was published and is now available on the ASRS website.

ASRS Model Applied

ASRS Model Applied

The ASRS model is utilized internationally in the aviation community. The International Confidential Aviation Safety Systems (ICASS) Group promotes confidential reporting systems as an effective method of enhancing flight safety in commercial air transport and general aviation operations.

International Civil Aviation Organization (ICAO) has revised Annex 13 – Accident Prevention and created Annex 19, Chapter 5, which addresses member states establishing a voluntary incident reporting system.

Because of the success of ASRS, there is also a growing interest in utilizing the ASRS reporting model for application to other disciplines such as medicine, railroad, maritime, security, and others.

ASRS Model Applied to International Aviation Community

- **UNITED STATES:** Aviation Safety Reporting System (ASRS) [1976]
- **UNITED KINGDOM:** Confidential Human factors Incident Reporting Program (CHIRP) [1982]
- **CANADA:** Confidential Aviation Safety Reporting Program (CASRP) [1985], SECURITAS [1995]
- **AUSTRALIA:** CAIR [1988], Report Confidentially (REPCON) [2007]
- **BRAZIL:** Confidential Flight Safety Report (RCSV) [1997]
- **JAPAN:** Aviation Safety Information Network (ASI-NET) [1999], VOICES [2014]
- **FRANCE:** Confidential Events Reporting System (REC) [2000], REX [2011]
- **TAIWAN:** Taiwan Confidential Aviation Safety Reporting System (TACARE) [2000]
- **SOUTH KOREA:** Korean Aviation voluntary Incident Reporting System (KAIRS) [2000]
- **CHINA:** Sino Confidential Aviation Safety reporting System (SCASS) [2004]
- **SINGAPORE:** Singapore Confidential Aviation Incident Reporting (SINCAIR) [2004]
- **SPAIN:** Safety Occurrence Reporting System (SNS) [2007]
  Safety Reporting System – SEPLA (SRS) [2007]
- **SOUTH AFRICA:** Confidential Aviation Hazard Reporting System (CAHRS) [2013]

ASRS Model Applied to International Aviation Community

International Confidential Aviation Safety Systems (ICASS)

ASRS Model Applications

Confidential Close Call Reporting System (C3RS)

A Confidential Close Call Reporting System to improve railroad safety. C3RS is a partnership between railroad carriers, railroad labor organizations, NASA, and the Federal Railroad Administration (FRA). (2010 to present)

The National Fire Fighters Near-Miss Reporting System

The project is administered by the International Association of Fire Chiefs (IAFC) in consultation with the National Fire Fighter Near-Miss Reporting System Task Force, with the goal to improve fire fighter safety. (2005 to present)

ASRS Summary

ASRS Summary

ASRS is a highly successful and trusted program that has served the needs of the aviation community for over 40 years. It is available to all participants in the National Airspace System who wish to report safety incidents and situations.

The ASRS identifies system deficiencies, and issues alerting messages to persons in a position to correct them. It educates through its newsletter *CALLBACK*, its journal *ASRS Directline* and through its research studies. Its database is a public repository which serves the needs of the FAA and NASA, and those of other organizations world-wide which are engaged in research and the promotion of safe flight.

Advantages of the ASRS Model

- System-Wide Perspective
- System-Wide Alerting
- Data Processing through Expert Analysts
- Comprehensive and Time Tested Coding Taxonomy
- Strong Immunity and Legal Provisions
- Information Sharing on Safety/Security
- National and International Reputation

Why Confidential Reporting Works

- When organizations want to learn more about the occurrence of events, the best approach is simply to ask those involved
- People are generally willing to share their knowledge if they are assured
  - Their identities will remain protected
  - There is no disciplinary or legal consequences
- A properly constructed *confidential*, *voluntary*, *non-punitive* reporting system can be used by any person to safely share information
- Confidential reporting systems have the means to answer the question *why* - why a system failed, why a human erred
- Incident/event data are complementary to the data gathered by other monitoring systems

Thank You

- **Contact the NASA Program Director**
  - Linda Connell – Linda.J.Connell@nasa.gov
- **Additional Information & Resources**
  - Confidentiality & Incentives to Report
    http://asrs.arc.nasa.gov/overview/confidentiality.html
  - Immunity Policies
    http://asrs.arc.nasa.gov/overview/immunity.html
  - Requesting ASRS Data
    http://asrs.arc.nasa.gov/search/requesting.html